Name: Date:

Polynomial Factoring solution (version 602)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 15 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(15)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 60}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-44}}{2}$$

$$x = \frac{4 \pm \sqrt{-4 \cdot 11}}{2}$$

$$x = \frac{4 \pm 2\sqrt{11}\, i}{2}$$

$$x = 2 \pm \sqrt{11}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 7i$ and $6 + 8i$ in standard form $(a + bi)$.**

Solution

$$(-2 + 7i) \cdot (6 + 8i)$$

$$-12 - 16i + 42i + 56i^2$$

$$-12 - 16i + 42i - 56$$

$$-12 - 56 - 16i + 42i$$

$$-68 + 26i$$

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3. **Write function $f(x) = x^3 + 8x^2 - 3x - 90$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	8	-3	-90
3		3	33	90
	1	11	30	0

$$f(x) = (x-3)(x^2+11x+30)$$

$$f(x) = (x-3)(x+6)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+6)^2 \cdot (x+2) \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.